

Comments of the Air Conditioning Contractors of America, California State Chapter  
Feb 4, 2003, Workshop on the 2005 Building Energy Efficiency Standards

From: Dale Gustavson [dale@calacca.org](mailto:dale@calacca.org)  
To: Bryan Alcorn, Public Advisor's Office  
CC: Glenn Friedman, Randel Riedel, Jeff Johnson  
Date: 02/04/03, 8:18 am  
Subject: COMMENTS ON ACM NJ-2005

Ladies and Gentlemen:

ACCA is the national non-profit trade association that for over thirty years has represented the educational, policy, and technical interests of the men and women who design, install, and maintain indoor environmental systems. With 60 chapter affiliates and some 9000 company members, ACCA is the nation's largest independent HVAC contractor association. The California State Chapter of ACCA (CAL ACCA) is headquartered at 7940 East Santa Cruz Avenue, Orange, CA 92869.

We regret that we will not be able to attend today's workshop on the draft revisions to the Standards and Alternative Calculation Method (ACM) Approval Manuals that are being considered for the next update to the Building Energy Efficiency Standards (Standards) for Residential and Nonresidential Buildings (California Building Code, Title 24, Part 6). ACCA supports code changes that "raise the quality bar" and improve the operating efficiencies of HVAC systems installed by contractors and for the most part support the proposed revisions as written.

Though not able to participate in person, we submit proposed the amendments attached and pasted below for your consideration and discussion. We believe the amendments improve the proposed revisions.

Respectfully,

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*2005 Nonresidential ACM Manual, Draft #1*

***NJ3. Construction Documentation***

The construction documents shall contain sufficient information to completely describe the heating, ventilation, and air conditioning (HVAC); lighting; and electric power distribution systems, including operational features and controls. The information required for each system shall include:

1. A description of the systems including the capacities of the equipment or systems.
2. A description of the system operation, control, user requirements and limitations.

2.3. A description of the testing requirements and the criteria for passing to be used for final systems acceptance.

3.4. A requirement for submittal of operation manuals and maintenance manuals as a condition of final acceptance, and a description of their format and content. The operation manual shall provide all relevant information needed for day-to-day operation and management of each system. The maintenance manual shall describe equipment inventory and support the maintenance program.

4.5. A requirement for submittal of record drawings and control documents as a condition of final acceptance.

For buildings other than those served by single-zone unitary HVAC systems, documentation shall also include:

1. A description of the design intent providing a detailed explanation of the ideas, concepts and criteria that are defined by the owner to be important. This includes the occupancy, operating schedules, temperature and humidity criteria, ventilation criteria and energy efficiency measures.

2. A description of the basis of design of the systems including all information necessary to prepare a design to accomplish the design intent. This includes load calculations, duct and pipe sizing, equipment selection criteria, control parameters, energy efficiency measures and ventilation strategy.

3. A description of the sequence of operation of the systems and their interaction with other systems, including fire prevention and fire protection systems.

4. Owner and operator requirements and written training plan with schedules and instructions for all owner and operator requirements including schedules, setpoints, limits of operation, maintenance criteria, energy efficiency measures and ventilation strategy.

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#### ***NJ6. Air Distribution Systems***

Acceptance requirements apply only to qualify for compliance credit for sealed ducts for single-zone packaged systems with ducts installed in unconditioned spaces between insulated ceilings and roofs.

##### **NJ6.1 Air Distribution Acceptance**

#### ***Plan Review***

Verify the Plan Review for the following:

... Specified ducts should be UL 181 listed.

... Specified pressure sensitive tapes, mastics, aerosol sealants, or other closure systems meet applicable requirements of UL 181, 181A, or 181B. Cloth backed rubberized adhesive tapes are prohibited unless used in combination with mastic and drawbands.

... Must comply with Sections 601, 602, 604, 605 and Standard 6-5 of the 2001 CMC.

... Duct sealing requirements, Leakage Class B or higher per the SMACNA Technical Paper on Duct Leakage, Rev. 12/92.

#### ***Construction Inspection***

Prior to Performance Testing, verify and document the following:

... Flexible duct layout does not have any sharp corners and bends that constrict airflow per CMC.

... Drawbands are either stainless steel worm-drive hose clamps or UV-resistant nylon duct ties.

... Flexible ducts are not constricted in any way (for example pressing against immovable

objects or squeezed through openings).

... Duct leakage tests should be performed before access to ductwork and associated connections are blocked by permanently installed construction material.

... Joints and seams are not sealed with a cloth back rubber adhesive tape unless used in combination with mastic and drawbands.

... Duct R-values are verified.

... Insulation is protected from damage and suitable for outdoor service if applicable.

### ***Equipment Start-up***

Step 1: Perform duct leakage test per 2001 Nonresidential ACM Approved Manual, Appendix G, Section 4.3.8.2. Certify the following:

... Duct leakage does not exceed 6% of total measured fan flow when tested according to the Nonresidential ACM Manual or the amount calculated for the specified SMACNA Leakage Class per the SMACNA Technical Paper on Duct Leakage, Rev. 12/92.

Step 2: Obtain third party field verification as required by Appendix G.

### ***NJ9. Demand Control Ventilation (DCV) Systems***

Demand control ventilation is tested on package systems per Standards Section 121 (c)3.

NJ9.1 Packaged Systems DCV Acceptance

#### ***Plan Review***

Verify the Plan Review for the following:

... Demand control ventilation is specified for all systems as required by the Standards.

#### ***Construction Inspection***

Prior to Performance Testing, verify and document the following:

... Carbon dioxide control sensor is factory calibrated (proof required) or field-calibrated with an accuracy of no less than 75 ppm.

... Outside air flow station is calibrated *OR* minimum outside air flow is measured and damper position set during system TAB procedures.

... The sensor is located in the room between 1ft and 6 ft above the floor or return air duct prior to the outside air intake.

... System controls are wired correctly to ensure proper control of outdoor air damper system.

### ***Equipment Start-up***

Step 1: Simulate a high CO2 load and enable the demand control ventilation by adjusting the demand control ventilation controller setpoint below ambient CO2 levels. Verify and document the following:

... Outdoor air damper modulates opens per Standards to maximum position to satisfy outdoor air requirements specified in Section 121 (c)4, Equation 121-A.

Step 2: Continue from Step 1 and disable demand control ventilation by adjusting the demand control ventilation controller setpoint above ambient CO2 levels. Verify and document the following:

... Outdoor air damper closes to minimum position.

... Measured minimum outside airflow CFM corresponds to the value found on Standards Mechanical Plan Check document MECH-1, Design O.A. CFM within +/- 10%.